E/ECE/324
E/ECE/TRANS/505 } Rev.1/Add.36/Rev.2/Amend.1

19 September 1996

AGREEMENT

CONCERNING THE ADOPTION OF UNIFORM TECHNICAL PRESCRIPTIONS FOR WHEELED VEHICLES, EQUIPMENT AND PARTS WHICH CAN BE FITTED AND/OR BE USED ON WHEELED VEHICLES AND THE CONDITIONS FOR RECIPROCAL RECOGNITION OF APPROVALS GRANTED ON THE BASIS OF THESE PRESCRIPTIONS */

(Revision 2, including the amendments entered into force on 16 October 1995)

Addendum 36: Regulation No. 37

Amendment 1

Incorporating:

Supplement 10 to the 03 series of amendments - Date of entry into force: 5 March 1995
Supplement 11 to the 03 series of amendments - Date of entry into force: 16 June 1995
Supplement 12 to the 03 series of amendments - Date of entry into force: 11 February 1996

UNIFORM PROVISIONS CONCERNING THE APPROVAL OF FILAMENT LAMPS FOR USE IN APPROVED LAMP UNITS OF POWER-DRIVEN VEHICLES AND OF THEIR TRAILERS

UNITED NATIONS

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*/ Former title of the Agreement:

Agreement Concerning the Adoption of Uniform Conditions of Approval and Reciprocal Recognition of Approval for Motor Vehicle Equipment and Parts, done at Geneva on 20 March 1958.

GE.96-23927

List of Contents, annexes, annex 1,

Sheets HS1, delete the words "(halogen filament lamp for motor cycles)."

Add at the end of the list new sheets, to read:

"....
Sheets H27W
Sheets P27W
Sheets P27W/7W
Sheet WY5W
Sheets H21W
Sheets W21W
Sheets W21/5W
Sheet W2.3W"

Paragraph 2.4.3.1., footnote 4/, amend to read:

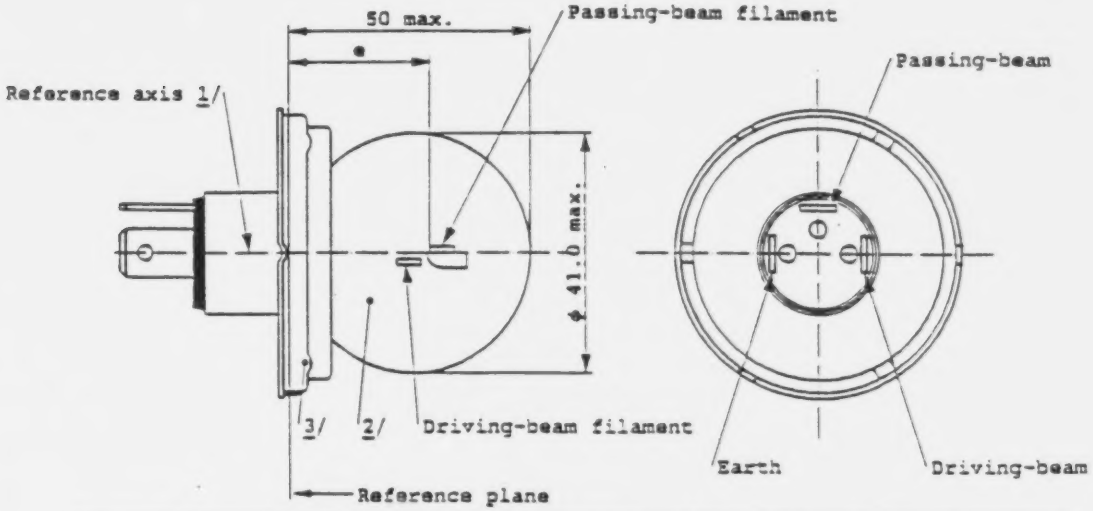
"4/ 1 for ..., 8 for the Czech Republic, ... 23 for Greece, 24 (vacant), 25 for Croatia, 26 for Slovenia, 27 for Slovakia, 28 for Belarus, 29 for Estonia, 30-36 (vacant) and 37 for Turkey. Subsequent numbers ...."

Annex 1, sheets R2/1 to R2/4, replace by the following text (sheets R2/1 to R2/3):

"

CATEGORY R2 **Sheet R2/1**

The drawings are intended only to illustrate the essential dimensions of the filament lamp.



ELECTRICAL AND PHOTOMETRIC CHARACTERISTICS									
		Filament lamps of normal production						Standard filament lamp	
Rated Values	Volts	6 4/		12 4/		24 4/		12 4/	
	Watts	45	40	45	40	55	50	45	40
Test voltage	Volts	6.3		13.2		28		13.2	
Objective Values	Watts	53 max.	47 max.	57 max.	51 max.	76 max.	69 max.	$52^{+0\%}_{-10\%}$	46±5%
	Luminous flux lm	720 min.	570 ±15%	860 min.	675 ±15%	1000 min.	860 ±15%		
Measuring flux 5/ lm		-	450	-	450	-	450		
Reference luminous flux at approximately 12 V								700	450

1/ The reference axis is the perpendicular to the reference plane and passes through the centre of the 45 mm cap diameter.

2/ The bulb shall be colourless or selective-yellow.

3/ No part of the cap shall, by reflection of light emitted by the passing-beam filament, throw any stray rising ray when the filament lamp is in the normal operating position on the vehicle.

4/ The values indicated on the left and on the right refer to the driving-beam filament and the passing-beam filament respectively.

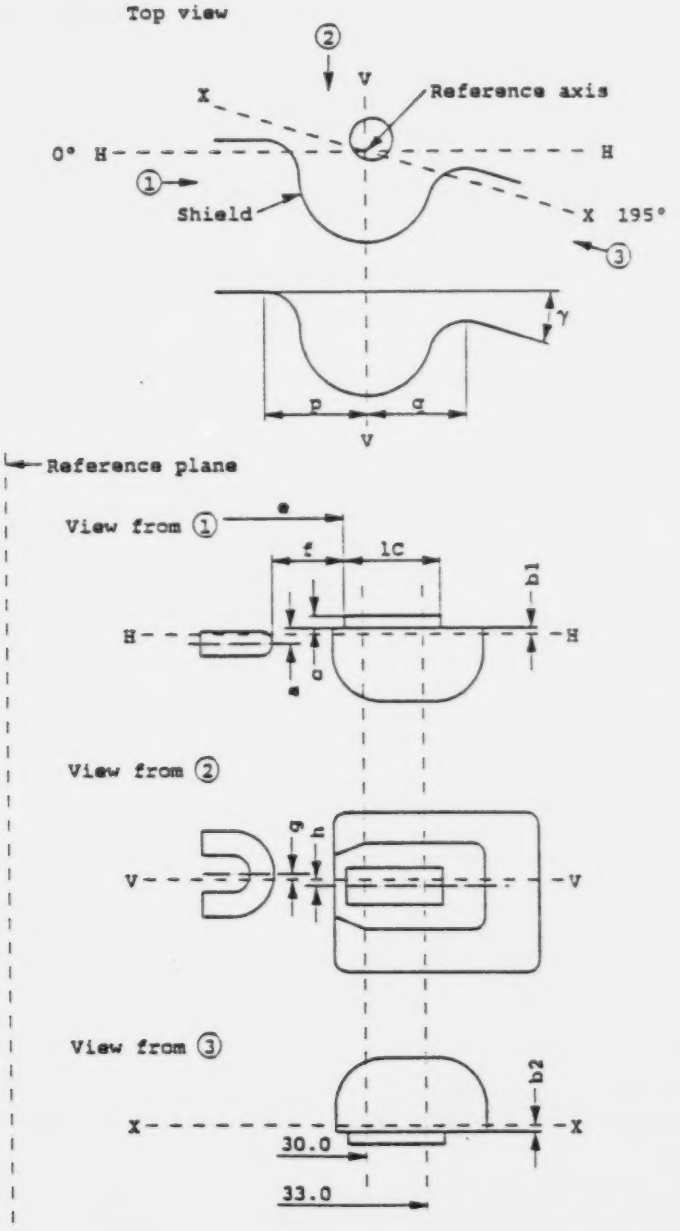
5/ Measuring luminous flux for measurements according to paragraph 3.8. of this Regulation.

Note: The R2 filament lamp is not recommended for new headlamp designs.

CATEGORY R2 Sheet R2/2

Position and dimensions of shield and filaments

The drawings are not mandatory with respect to the design of the shield and filaments



CATEGORY R2 Sheet R2/3

FILAMENTS AND SHIELD POSITION AND DIMENSIONS 1/				
Dimensions in mm			Tolerance	
			Filament lamps of normal production	Standard filament lamp
			6V 12V 24V	12V
a		0.60	±0.35	±0.15
b1/30.0 2/ b1/33.0		0.20 b1/30.0 mv 3/	±0.35	±0.15
b2/30.0 2/ b2/33.0		0.20 b2/30.0 mv 3/	±0.35	±0.15
c/30.0 2/ c/33.0		0.50 c/30.0 mv 3/	±0.30	±0.15
e	6, 12V 24V	28.5 28.8	±0.35	±0.15
f	6, 12V 24V	1.8 2.2	±0.40	±0.20
g		0	±0.50	±0.30
h/30.0 2/ h/33.0		0 h/30 mv 3/	±0.50	±0.30
1/2(p-g)		0	±0.60	±0.30
lc		5.5	±1.50	±0.50
γ 4/		15°nom.		
Cap P45t-41 in accordance with IEC Publ.61 (sheet 7004-95-4)				

1/ The position and dimensions of the shield and filaments shall be checked by means of the method of measurement as described in IEC Publication 809.

2/ To be measured at the distance from the reference plane indicated in millimetres behind the stroke.

3/ mv = measured value.

4/ The angle γ is only for shield design and has not to be checked on finished filament lamps. "

Annex 1, sheet H1/2, replace in the table the IEC 61 sheet number by "sheet 7004-46-2".

Annex 1, sheet H2/2, replace in the table the IEC 61 sheet number by "sheet 7004-99-2".

Annex 1, sheet H3/3, replace in the table the IEC 61 sheet number by "sheet 7004-47-3".

Annex 1, sheet H4/2, replace in the table the IEC 61 sheet number by "sheet 7004-39-5".

Annex 1, sheet P21W/1, replace in the table the IEC 61 sheet number by "sheet 7004-11A-8".

Annex 1, sheet P21/5W/1, replace in the table the IEC 61 sheet number by "sheet 7004-11B-7".

Annex 1, sheets R5W/1 and R10W/1, replace in the table the IEC 61 sheet number by "sheet 7004-11A-8".

Annex 1, sheets C5W/1 and C21W/1, replace in the table the IEC 61 sheet number by "sheet 7004-81-4".

Annex 1, sheet T4W/1, replace in the table the IEC 61 sheet number by "sheet 7004-14-7".

Annex 1, sheets W3W/1 and W5W/1, replace in the table the IEC 61 sheet number by "sheet 7004-91-3".

Annex 1, sheet S1/S2/2, replace in the table the IEC 61 sheet number by "sheet 7004-12-7".

Annex 1, sheet HS1/2, replace in the table the IEC 61 sheet number by "sheet 7004-34-2".

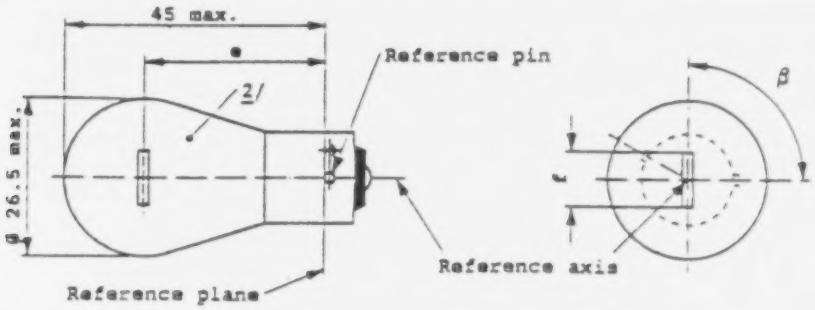
Annex 1, sheet HS2/1, replace in the table the IEC 61 sheet number by "sheet 7004-35-2".

Annex 1, sheets HS1/1, HS1/2, HS1/3, HS1/4, HS1/5, in the titles, delete the words "HALOGEN MOTOR CYCLE FILAMENT LAMP" (five times) and further, at the bottom of sheet HS1/1, delete the words "TO BE USED ON MOTOR CYCLES ONLY".

Annex 1, sheets PY21W/1 to PY21W/3, replace by the following text (sheets PY21W/1 and PY21W/2):

"

CATEGORY PY21W — Sheet PY21W/1



DIMENSIONS in mm	Filament lamps of normal production			Standard filament lamp 5/
	min.	nom.	max.	
e		31.8 3/		31.8 ± 0.3
f 4/			7.0	7.0 $^{+0}_{-2}$
Lateral deviation 1/		3/		0.3 max
β	75°	90°	105°	90° ± 5°
Cap BAU15s: in accordance with IEC Publ. 61 (sheet 7004-19-1)				
ELECTRICAL AND PHOTOMETRIC CHARACTERISTICS				

Rated values		V	12	24	12
		W	21		21
Test voltage		V	13.5	28.0	
Objective values	Watts	W	25	28	25 at 13.5 V
		±%	6		6
	Luminous flux	lm	280		
		±%	20		
Reference luminous flux : Amber bulb: 280 lm Clear bulb: 460 lm at approx. 13.5 V					

1/ Maximum lateral deviation of filament centre from two mutually perpendicular planes both containing the reference axis and one containing the axis of the reference pin.

2/ The bulb of production lamps shall be amber. (See also note 5/).

3/ To be checked by means of a box system, sheet PY21W/2.

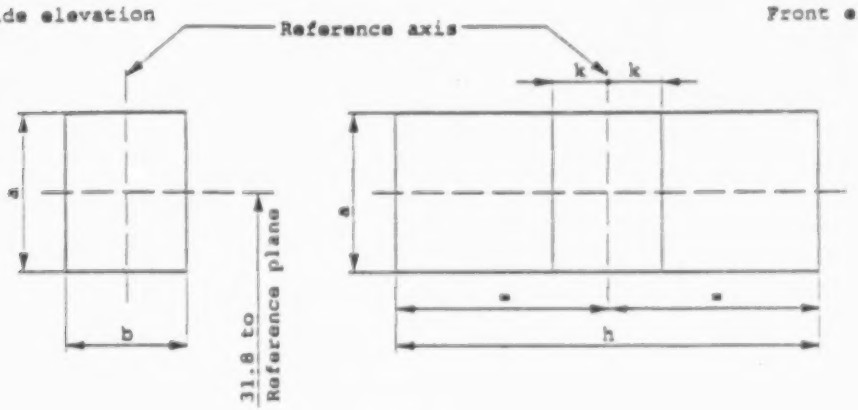
4/ For 24-Volt heavy-duty lamps having a different filament shape, additional specifications are under consideration.

5/ The bulb of standard filament lamps shall be amber or clear. For amber standard filament lamps, changes of the bulb temperature shall not affect the luminous flux which might impair photometric measurements of signalling devices. Moreover the colour shall be in the lower part of the tolerance area.

CATEGORY PY21W Sheet PY21W/2

Screen projection requirements

This test is used to determine, by checking whether the filament is correctly positioned relative to the reference axis and the reference plane and has an axis perpendicular, within ± 15°, to the plane through the centre line of the reference pin and the reference axis, whether a filament lamp complies with the requirements.



Reference	a	b	h	k
Dimension	3.5	3.0	9.0	1.0

Test procedures and requirements.

1. The filament lamp is placed in a holder capable of being rotated about its axis and having either a calibrated scale or fixed stops corresponding to the angular displacement tolerance limits. The holder is then so rotated that an end view of the filament is seen on the screen on to which the image of the filament is projected. The end view of the filament shall be obtained within the angular displacements tolerance limits.

2. Side elevation
The filament lamp placed with the cap down, the reference axis vertical and the filament seen end-on, the projection of the filament shall lie entirely within a rectangle of height "a" and width "b", having its centre at the theoretical position of the centre of the filament.

3. Front elevation
The filament lamp placed with the cap down and the reference axis vertical, the filament lamp being viewed in a direction at right angles to the filament axis:

3.1 The projection of the filament shall lie entirely within a rectangle of height "a" and width "h", having its centre at the theoretical position of the centre of the filament.

3.2 The centre of the filament shall not be offset by more than distance "k" from the reference axis. "

Annex 1, sheets H7/1 to H7/4, replace by the following text (sheets H7/1 to H7/4):

" CATEGORY H7 Sheet H7/1

The drawings are intended only to illustrate the essential dimensions of the filament lamp

Dimensions in millimetres

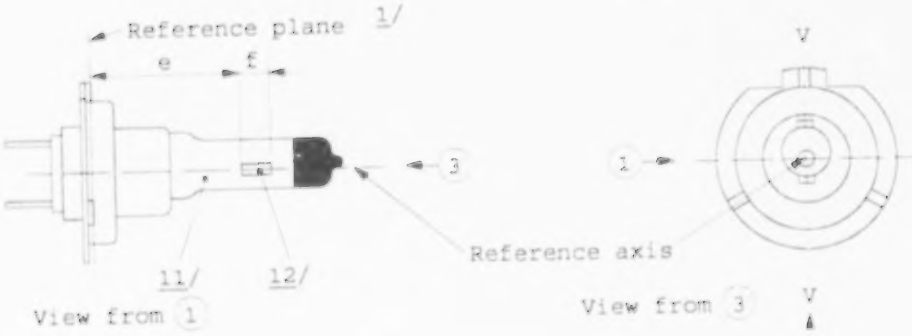


Figure 1 Main drawing

Figure 2
Maximum lamp outline 3/

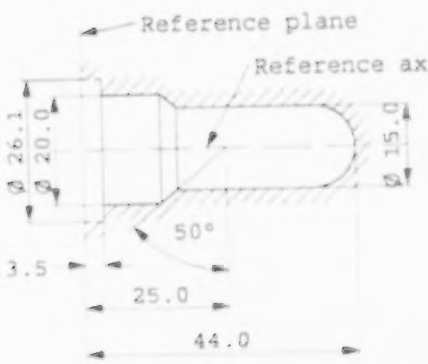


Figure 3
Definition of reference axis 2/

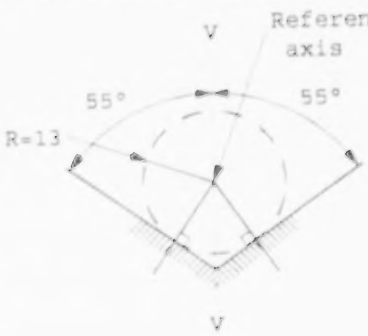


Figure 4
Distortion free area 4/
and black top 5/

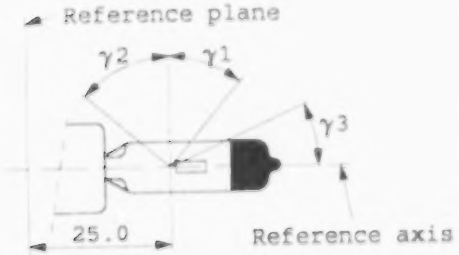
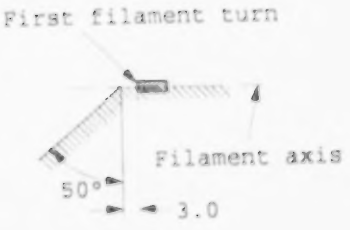


Figure 5
Metal free zone 6/



CATEGORY H7 Sheet H7/2

Figure 6
Permissible offset of filament axis
(For standard filament lamps only) 9/

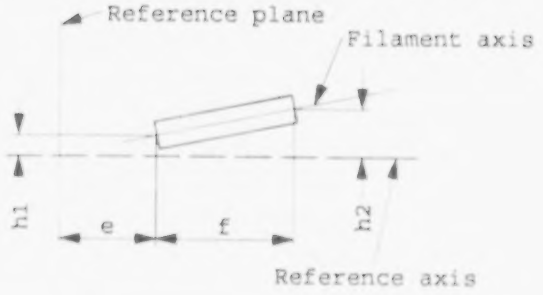
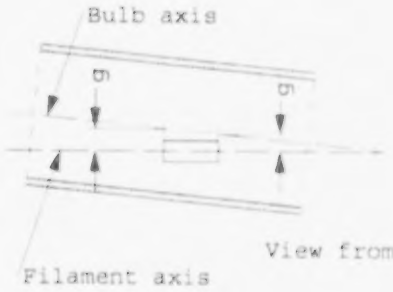


Figure 7
Bulb eccentricity 10/



Dimensions in mm		Filament lamp of normal production		Standard filament lamp
		12 V	24 V	12 V
e	7/	25.0	8/	25.0 ± 0.1
f	7/	4.5	4.9 8/	4.1 ± 0.1
g	10/	0.5 min.		u.c.
h1	9/	0	8/	0 ± 0.1
h2	9/	0	8/	0 ± 0.15
γ^1	4/	40° min.		40° min.
γ^2	4/	50° min.		50° min.
γ^3	5/	30° min.		30° min.
Cap PX 26d in accordance with IEC Publication 61 (sheet 7004-5-1)				
ELECTRICAL AND PHOTOMETRIC CHARACTERISTICS				
Rated values	Volts	12	24	12
	Watts	55	70	55
Test voltage	Volts	13.2	28.0	13.2
Objective values	Watts	58 max.	75 max.	58 max.
	Luminous flux lm	1500	1750	
	±%	10	10	
Reference luminous flux for headlamp testing: 1100 lm at approx. 12V				

CATEGORY H7 Sheet H7/3

1/ The reference plane is defined by the points on the surfaces of the holder on which the three supporting bosses of the cap ring will rest.

2/ The reference axis is perpendicular to the reference plane and crosses the intersection of the two perpendiculars as indicated in figure 3 on sheet H7/1.

3/ Glass bulb and supports shall not exceed the envelope as indicated in figure 2 on sheet H7/1. The envelope is concentric to the reference axis.

4/ Glass bulb shall be optically distortion free within the angles γ_1 and γ_2. This requirement applies to the whole bulb circumference within the angles γ_1 and γ_2.

5/ The obscuration shall extend at least to angle γ_3 and shall extend at least to the cylindrical part of the bulb on the whole bulb top circumference.

6/ The internal design of the lamp shall be such that stray light images and reflections are only located above the filament itself seen from the horizontal direction. (View (1) as indicated in figure 1 on sheet H7/1). No metal parts other than filament turns shall be located in the shaded area as seen in figure 5 on Sheet H7/1.

7/ The end of the filaments are defined as the points where, when the viewing direction is direction (1) as shown in figure 1 on sheet H7/1, the projection of the outside of the end turns crosses the filament axis. (Special instructions for coiled-coil filaments are under consideration)

8/ To be checked by means of a "Box System". Sheet H7/4.

9/ The offset of the filament with respect to the reference axis is measured only in viewing directions (1) and (2) as shown in figure 1 in sheet H7/1. The points to be measured are those where the projection of the outside of the end turns nearest to or furthest from the reference plane crosses the filament axis.

10/ Offset of filament in relation to bulb axis measured in two planes parallel to the reference plane where the projection of the outside of the end turns nearest to or furthest from the reference plane crosses the filament axis.

11/ The bulb shall be colourless or selective-yellow.

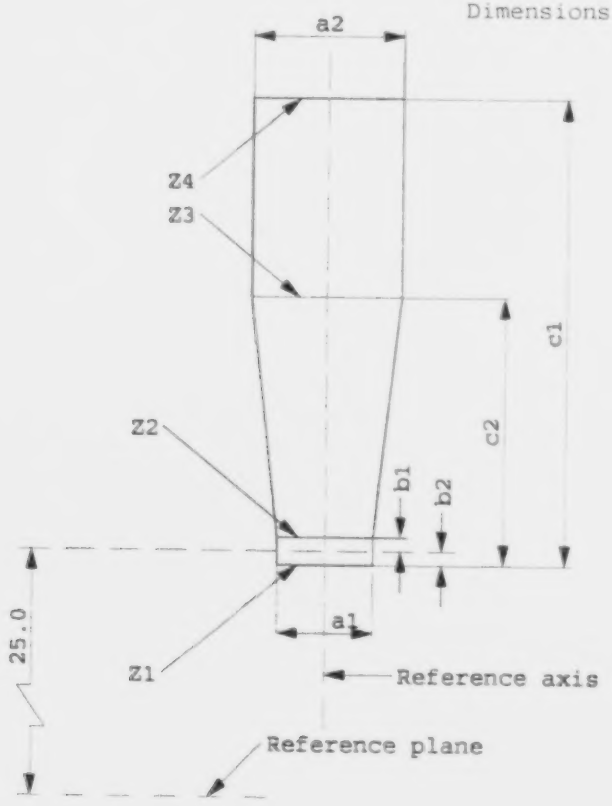
12/ Notes concerning the filament diameter.
- No actual diameter restrictions apply but the objective for future developments is to have d max. = 1.3 mm for 12 V and d max. = 1.7 for 24V filament lamps.
- For the same manufacturer, the design diameter of standard (étalon) filament lamp and filament lamp of normal production shall be the same.

CATEGORY H7 Sheet H7/4

Screen projection requirements

This test is used to determine, by checking whether the filament is correctly positioned relative to the reference axis and the reference plane, whether a filament lamp complies with the requirements.

Dimensions in millimetres



	a1	a2	b1	b2	c1	c2
12 V	d + 0.30	d + 0.50	0.2		4.6	4.0
24 V	d + 0.60	d + 1.00	0.25		5.9	4.4

d = diameter of filament

The ends of the filament as defined on sheet H7/3, foot-note 7/, must lie between lines Z1 and Z2 and between Z3 and Z4.

The filament position is checked solely in directions ① and ② as shown on sheet H7/1, figure 1.

The filament must lie entirely within the limits shown. "

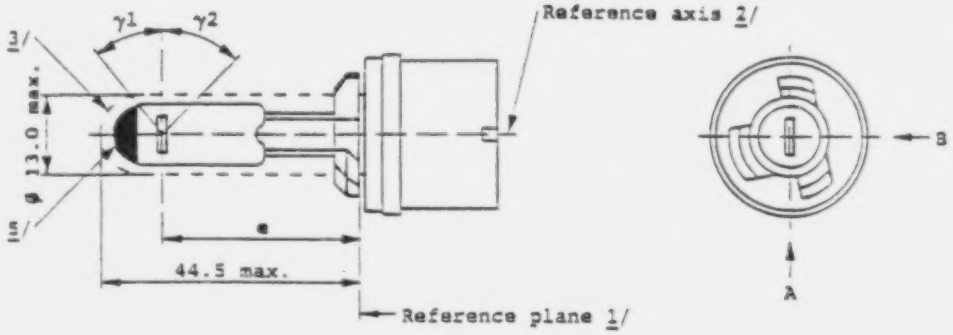
Annex 1, insert new sheets H27W/1 to H27W/3, P27W/1 and P27W/2, P27W/7W/1 to P27W/7W/3, WY5W/1 and H21W/1 and H21W/2, to read as follows:

"

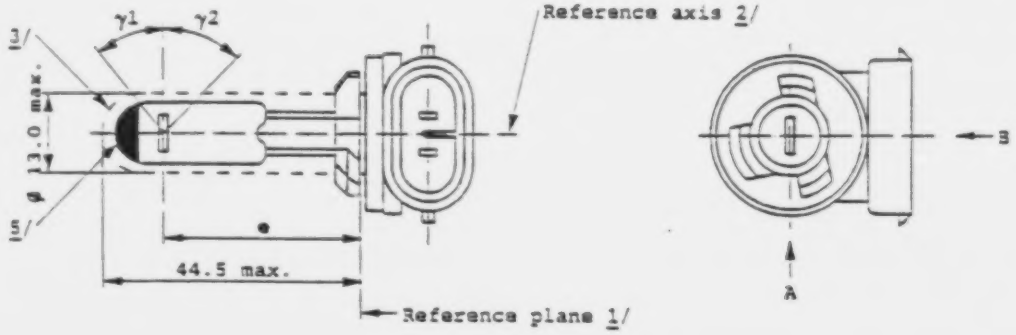
CATEGORIES H27W/1 AND H27W/2 **Sheet H27W/1**

The drawings are intended only to illustrate the essential dimensions of the filament lamp.

Category H27W/1

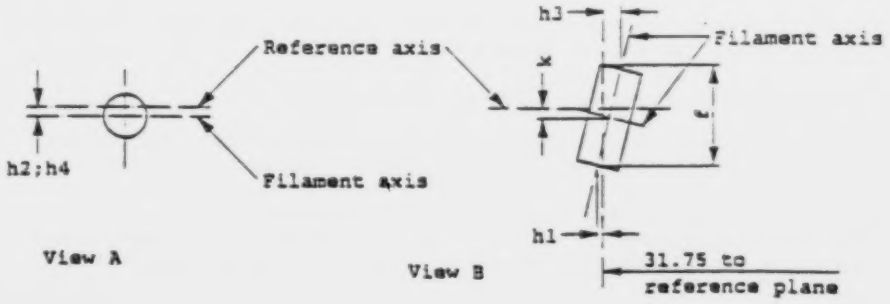


Category H27W/2



Filament dimensions and position

(Dimension f for all filament lamps)
(Dimensions h1, h2, h3, h4 and k for standard filament lamps only)



CATEGORIES H27W/1 AND H27W/2 Sheet H27W/2

Dimensions in mm		Filament lamps of normal production		Standard filament lamp
		12 V		12 V
e		31.75 5/		31.75 ± 0.25
f	8/	4.8 max		4.2 ± 0.2
k		0 6/		0.0 ± 0.25
h1 ; h3	7/	0 6/		0.0 ± 0.25
h2 ; h4	7/	0 6/		0.0 ± 0.25
γ_1	4/	38° nom		38° nom
γ_2	4/	44° min		44° min
Cap H27W/1: PG 13 H27W/2: PGJ13		in accordance with IEC Publ.61 (sheet 7004-107-1)		
ELECTRICAL AND PHOTOMETRIC CHARACTERISTICS				
Rated values	Volts	12		12
	Watts	27		27
Test voltage	Volts	13.5		13.5
Objective values	Watts	31 max		31 max
	Luminous flux lm ± %	477 15		
Reference luminous flux: 477 lm at approx. 13.5V				

1/ The reference plane is the plane formed by the underside of the bevelled lead-in flange of the cap.

2/ The reference axis is perpendicular to the reference plane and passing through the centre of the 13.10 mm cap diameter.

3/ Glass bulb and supports shall not exceed the size of a theoretical cylinder centred on the reference axis.

4/ Glass bulb shall be optically distortion-free within the angles γ_1 and γ_2. This requirement applies to the whole bulb circumference within the angles γ_1 and γ_2.

5/ The obscuration shall extend over the whole bulb top including the bulb cylindrical portion up to the intersection with γ_1.

6/ To be checked by means of a box system, sheet H27W/3.

7/ For standard filament lamps, the points to be measured are those where the projection of the outside of the end turns crosses the filament axis.

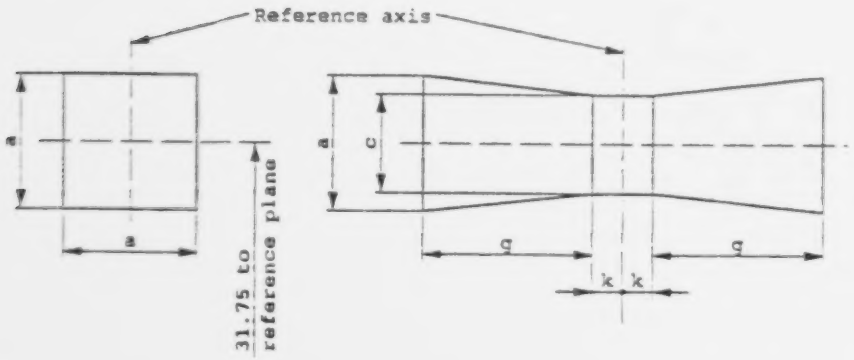
8/ The ends of the filament are defined by the intersections of the outsides of the first and of the last light emitting turn, respectively, with the plane parallel to and 31.75 mm from the reference plane.

CATEGORIES H27W/1 AND H27W/2 Sheet H27W/3

Screen projection requirements

This test is used to determine, by checking the correctness of the filament relative to the reference axis and reference plane, whether a filament lamp complies with the requirements.

View A View B



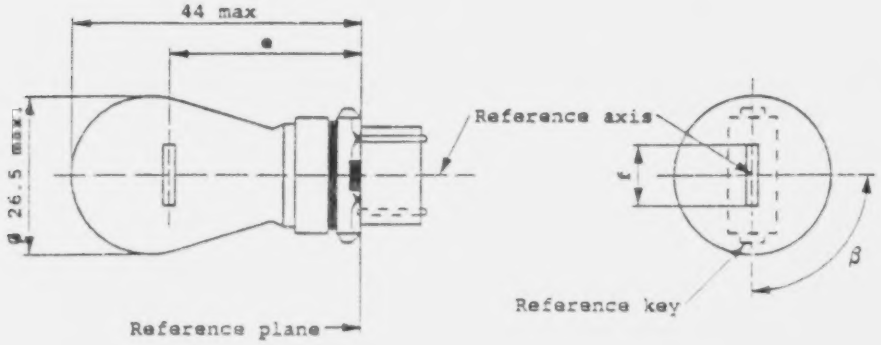
Reference	a	c	k	g
Dimensions	d + 1.2	d + 1.0	0.5	2.4

d = actual filament diameter

The filament shall lie entirely within the limits shown

The centre of the filament shall lie within the limits of dimension k.

CATEGORY P27W Sheet P27W/1



DIMENSIONS in mm			Filament lamps of normal production			Standard filament lamp
			min.	nom.	max.	
e				27.9 3/		27.9 ± 0.3
f					9.9	9.9 $^{+0}_{-2}$
Lateral deviation 2/					3/	0.0 ± 0.4
β			75° 3/	90°	105° 3/	90° ± 5°
Cap W2.5x16d in accordance with IEC Publ. 61 (sheet 7004-104-1)						
ELECTRICAL AND PHOTOMETRIC CHARACTERISTICS						
Rated values		V	12			12
		W	27			27
Test voltage		V	13.5			
Objective values	Watts	W	29.2			29.2 at 13.5 V
		±%	10			10
	Luminous flux	lm	475			
		±%	15			
Reference luminous flux : 475 lm at approx. 13.5 V						

1/ The reference axis is defined with respect to the reference keys and is perpendicular to the reference plane.

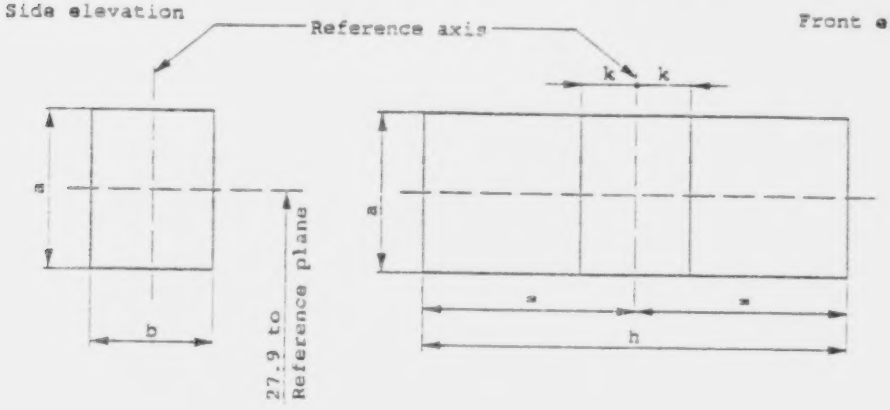
2/ Maximum lateral deviation of filament centre from two mutually perpendicular planes both containing the reference axis and one containing axis through reference keys.

3/ To be checked by means of a box system, sheet P27W/2

CATEGORY P27W Sheet P27W/2

Screen projection requirements

This test is used to determine, by checking whether the filament is correctly positioned relative to the reference axis and the reference plane and has an axis perpendicular, within ± 15°, to the plane through the centres of the keys and the reference axis, whether a filament lamp complies with the requirements.



Reference	a	b	h	k
Dimension	3.5	3.0	11.9	1.0

Test procedures and requirements.

1. The filament lamp is placed in a holder capable of being rotated about its axis and having either a calibrated scale or fixed stops corresponding to the angular displacement tolerance limits. The holder is then so rotated that an end view of the filament is seen on the screen on to which the image of the filament is projected. The end view of the filament shall be obtained within the angular displacements tolerance limits.

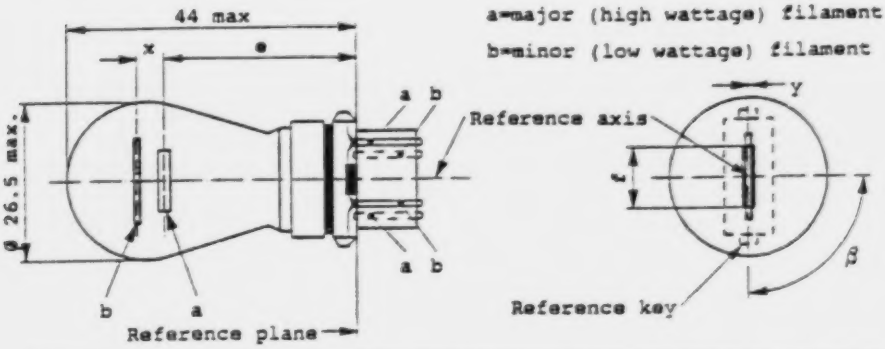
2. Side elevation
The filament lamp placed with the cap down, the reference axis vertical and the filament seen end-on, the projection of the filament shall lie entirely within a rectangle of height "a" and width "b", having its centre at the theoretical position of the centre of the filament.

3. Front elevation
The filament lamp placed with the cap down and the reference axis vertical, the filament lamp being viewed in a direction at right angles to the filament axis:

3.1 The projection of the filament shall lie entirely within a rectangle of height "a" and width "h", having its centre at the theoretical position of the centre of the filament.

3.2 The centre of the filament shall not be offset by more than distance "k" from the reference axis.

CATEGORY P27/7W Sheet P27/7W/1



DIMENSIONS in mm	Filament lamps of normal production			Standard filament lamp
	min.	nom.	max.	
e		27.9 3/		27.9 ± 0.3
f			9.9	9.9 $^{+0}_{-2}$
Lateral deviation 2/			3/	0.0 ± 0.4
x 4/		5.1 3/		5.1 ± 0.5
y 4/		0.0 3/		0.0 ± 0.5
β	75° 3/	90°	105° 3/	90° ± 5°
Cap W2.5x16q in accordance with IEC Publ. 61 (sheet 7004-104-1)				

ELECTRICAL AND PHOTOMETRIC CHARACTERISTICS

Rated values		V	12			12	
		W	27	7		27	7
Test voltage		V	13.5				
Objective values	Watts	W	29.2	7.7		29.2 | 7.7 at 13.5 V	
		±%	10			10	
	Luminous flux	lm	475	36			
		±%	15				
Reference luminous flux : 475 and 36 lm at approx. 13.5 V							

1/ The reference axis is defined with respect to the reference keys and is perpendicular to the reference plane.

2/ Maximum lateral deviation of major (high wattage) filament centre from two mutually perpendicular planes both containing the reference axis and one containing axis through reference keys.

3/ To be checked by means of a box system, sheets P27W/2 & 3.

4/ "x"and "y" denote the offset of the axis of the minor (low wattage) filament with respect to the axis of the major (high wattage) filament

CATEGORY P27/7W Sheet P27/7W/2

Screen projection requirements

This test is used to determine, by checking whether:
(a) the major (high wattage) filament is correctly positioned relative to the reference axis and reference plane and has an axis perpendicular, within ± 15°, to the plane through the centres of the keys and the reference axis; and whether:
(b) the minor (low wattage) filament is correctly positioned relative to the major (high wattage) filament,
whether a filament lamp complies with the requirements.

Test procedures and requirements.

1. The filament lamp is placed in a holder capable of being rotated about its axis and having either a calibrated scale or fixed stops corresponding to the angular displacement tolerance limits. The holder is then so rotated that an end view of the major filament is seen on the screen on to which the image of the filament is projected. The end view of that filament shall be obtained within the angular displacement tolerance limits.

2. Side elevation
The filament lamp placed with the cap down, the reference axis vertical, the reference key to the right and the major filament seen end-on:

2.1. the projection of the major filament shall lie entirely within a rectangle of height "a" and width "b", having its centre at the theoretical position of the centre of the filament;

2.2. the projection of the minor filament shall lie entirely within a rectangle of width "c" and height "d" having its center at a distance "u" above the theoretical position of the centre of the major filament.

3. Front elevation
The filament lamp placed with the cap down and the reference axis vertical, the filament lamp being viewed in a direction at right angles to the axis of the major filament:

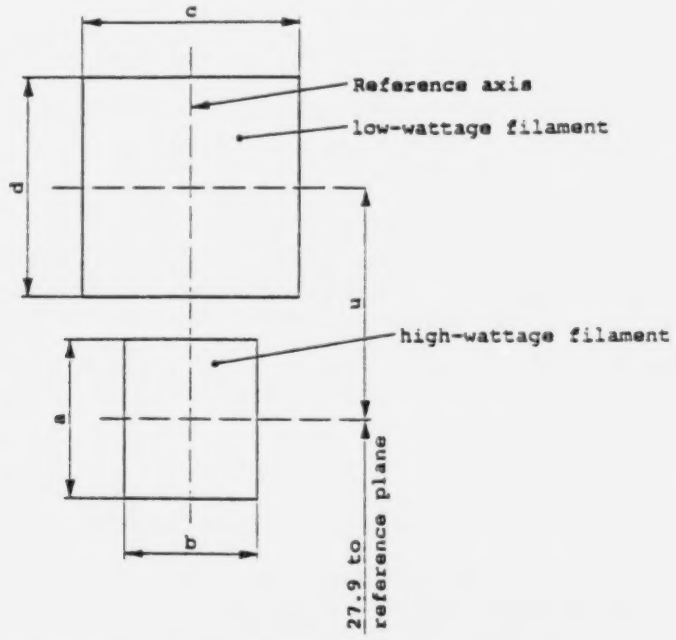
3.1. the projection of the major filament shall lie entirely within a rectangle of height "a" and width "h", centred on the theoretical position of the centre of the filament;

3.2. the centre of the major filament shall not be offset by more than distance "k" from the reference axis;

3.3. the centre of the minor filament shall not be offset from the reference axis by more than ± 2mm (±0.4 mm for standard filament lamps).

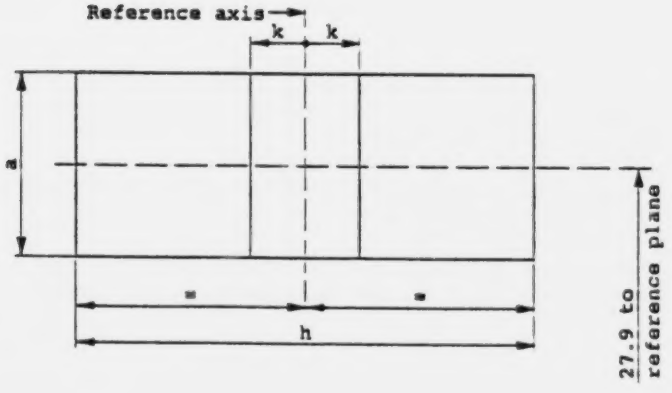
CATEGORY P27/7W Sheet P27/7W/3

Side elevation



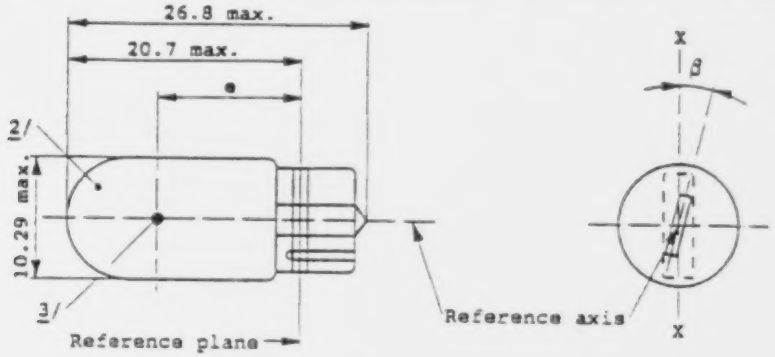
Reference	a	b	c	d	u
Dimensions	3.5	3.0	4.8		5.1

Front elevation



Reference	a	h	k
Dimensions	3.5	11.9	1.0

CATEGORY WY5W — Sheet WY5W/1



DIMENSIONS in mm			Filament lamps of normal production			Standard 4/ filament lamp
			min.	nom.	max.	
e			11.2	12.7	14.2	12.7 ± 0.3
Lateral deviation 1/					1.5	0.5 max
β			-15°	0°	+15°	0° ± 5°
Cap W 2.1 x 9.5d in accordance with IEC Publ. 61 (sheet 7004-91-3)						
ELECTRICAL AND PHOTOMETRIC CHARACTERISTICS						
Rated values		V	6	12	24	12
		W	5			5
Test voltage		V	6.75	13.5	28.0	
Objective values	Watts	W	5		7	5 at 13.5 V
		±%	10			10
	Luminous flux	lm	30			
		±%	20			
Reference luminous flux : Amber bulb: 30 lm at approx. 13.5 V Clear bulb: 50 lm						

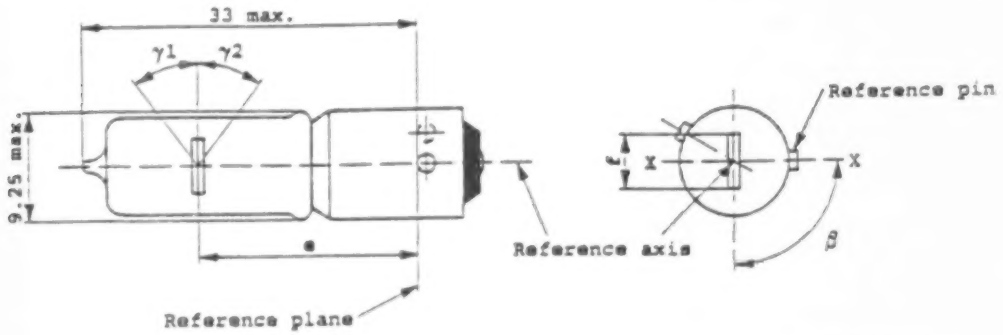
1/ Maximum lateral deviation of filament centre from two mutually perpendicular planes both containing the reference axis and one containing the axis XX.

2/ The bulb of production lamps shall be amber. (See also note 4/).

3/ See paragraph 3.5.3.

4/ The bulb of standard filament lamps shall be amber or clear. For amber standard filament lamps, changes of the bulb temperature shall not affect the luminous flux which might impair photometric measurements of signalling devices. Moreover the colour shall be in the lower part of the tolerance area.

CATEGORY H21W Sheet H21W/1



DIMENSIONS in mm		Filament lamps of normal production			Standard filament lamp
		min.	nom.	max.	
e			20.0 1/		20.0 ± 0.25
f	12 V			3.8	3.8 +0 −1
	24 V			4.5	
Lateral deviation 2/				1/	0.0 ± 0.15 3/
β		82.5°	90°	97.5°	90° ± 5°
γ1, γ2 4/		45°			45° min
Cap BAY9s: in accordance with IEC Publ. 61 (sheet 7004-9-1)					
ELECTRICAL AND PHOTOMETRIC CHARACTERISTICS					
Rated values	V	12	24		12
	W	21	21		6
Test voltage	V	13.5	28		
Objective values	Watts W	25	28		25 at 13.5 V
	Watts ±%	5	5		5
	Luminous flux lm	600	600		
	Luminous flux ±%	12	15		
Reference luminous flux : 600 lm at approx. 13.5 V					

1/ To be checked by means of a box system, sheet H21W/2.

2/ Maximum lateral deviation of filament centre from two mutually perpendicular planes both containing the reference axis and one containing the axis X-X.

3/ The lateral deviation with respect to the plane perpendicuar to axis XX, is measured in the position described in clause 1 of the test procedures on sheet H21W/2.

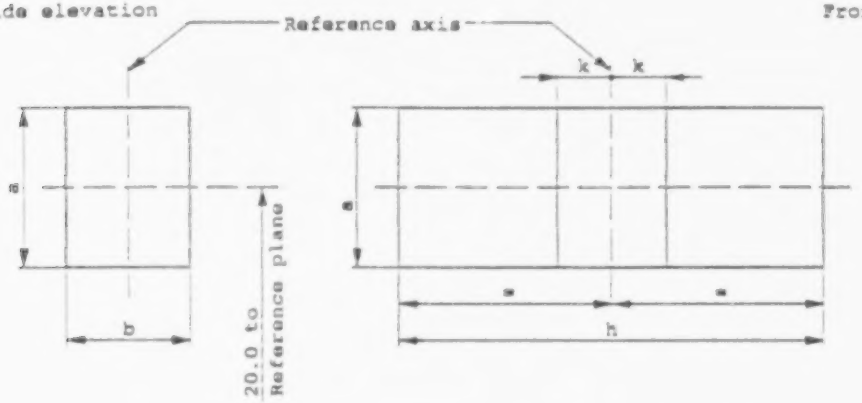
4/ In the area between thee outer legs of the angles γ1 and γ2, the bulb shall have no optically distorting areas and the curvature of the bulb shall have a radius not less than 50% of the actual bulb diameter.

CATEGORY H21W Sheet H21W/2

Screen projection requirements

This test is used to determine, by checking whether the filament is correctly positioned relative to the reference axis and the reference plane and has an axis perpendicular, within ± 7.5°, to the plane through the centre line of the reference pin and the reference axis, whether a filament lamp complies with the requirements.

Side elevation Front elevation



Reference	a	b	h	k
Dimension	d + 1.0	d + 1.0	f + 1.2	0.5

d = actual filament diameter
f = actual filament length

Test procedures and requirements.

1. The filament lamp is placed in a holder capable of being rotated about its axis and having either a calibrated scale or fixed stops corresponding to the angular displacement tolerance limits. The holder is then so rotated that an end view of the filament is seen on the screen on to which the image of the filament is projected. The end view of the filament shall be obtained within the angular displacements tolerance limits.

2. Side elevation
The filament lamp placed with the cap down, the reference axis vertical and the filament seen end-on, the projection of the filament shall lie entirely within a rectangle of height "a" and width "b", having its centre at the theoretical position of the centre of the filament.

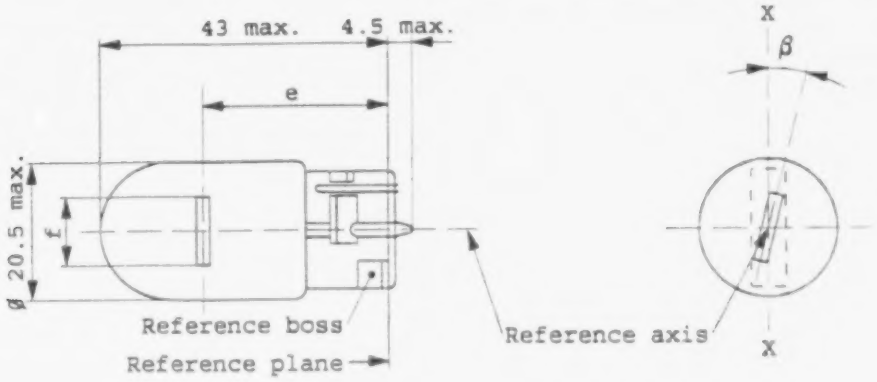
3. Front elevation
The filament lamp placed with the cap down and the reference axis vertical, the filament lamp being viewed in a direction at right angles to the filament axis:

3.1 The projection of the filament shall lie entirely within a rectangle of height "a" and width "h", having its centre at the theoretical position of the centre of the filament.

3.2 The centre of the filament shall not be offset by more than distance "k" from the reference axis.

Annex 1, add at the end new sheets W21W/1, W21W/2 and W21/5W/1 to W21/5W/3, to read as follows:

"CATEGORY W21W Sheet W21W/1



DIMENSIONS in mm	Filament lamps of normal production			Standard filament lamp
	min.	nom.	max.	
e		29.0 2/		29.0 ± 0.3
f			7.5	7.5 $^{+0}_{-2}$
Lateral deviation 1/			2/	0.5 max.
β	-15° 2/	0°	+15° 2/	0° ± 5°
Cap W 3 x 16d in accordance with IEC Publ. 61 (sheet 7004-105-2)				
ELECTRICAL AND PHOTOMETRIC CHARACTERISTICS				
Rated values — Volts		12		12
Rated values — Watts		21		21
Test voltage — Volts		13.5		
Objective values — Watts		25		25 at 13.5 V
Objective values — ±%		6		6
Objective values — Luminous flux lm		460		
Objective values — ±%		15		
Reference luminous flux : 460 lm at approx. 13.5 V				

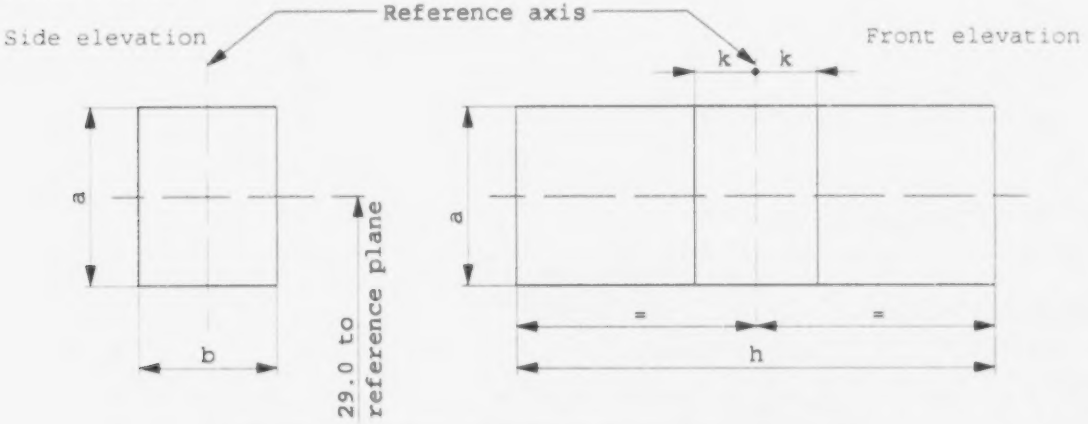
1/ Maximum lateral deviation of filament centre from two mutually perpendicular planes both containing the reference axis and one containing axis X-X.

2/ To be checked by means of a box system, see sheet W21W/2.

CATEGORY W21W Sheet W21W/2

Screen projection requirements

This test is used to determine, by checking whether the filament is correctly positioned relative to the reference axis and the reference plane and has an axis perpendicular, within ± 15°, to the plane through the axis X-X and the reference axis, whether a filament lamp complies with the requirements.



Reference	a	b	h	k
Dimension	3.5	3.0	9.5	1.0

Test procedure and requirements.

1. The filament lamp is placed in a holder capable of being rotated about its axis and having either a calibrated scale or fixed stops corresponding to the angular displacement tolerance limits,.i.e ± 15°. The holder is then so rotated that an end view of the filament is seen on the screen on to which the image of the filament is projected. The end view of the filament shall be obtained within the angular displacements tolerance limits (± 15°).

2. Side elevation
The filament lamp placed with the cap down, the reference axis vertical and the filament seen end-on, the projection of the filament shall lie entirely within a rectangle of height "a" and width "b", having its centre at the theoretical position of the centre of the filament.

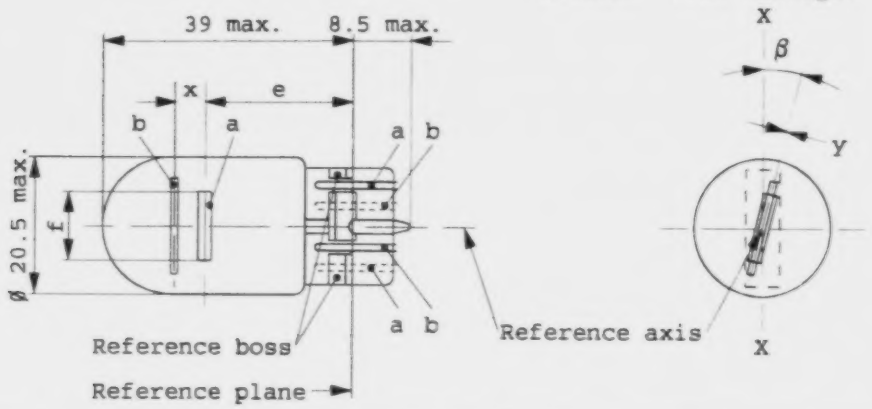
3. Front elevation
The filament lamp placed with the cap down and the reference axis vertical, the filament lamp being viewed in a direction at right angles to the filament axis:

3.1. the projection of the filament shall lie entirely within a rectangle of height "a" and width "h", having its centre at the theoretical position of the centre of the filament;

3.2. the centre of the filament shall not be offset by more than distance "k" from the reference axis.

CATEGORY W21/5W Sheet W21/5W/1

a=major (high wattage) filament
b=minor (low wattage) filament



DIMENSIONS in mm	Filament lamps of normal production			Standard filament lamp
	min.	nom.	max.	
e		25.0 1/		25.0 ± 0.3
f			7.5	7.5 $^{+0}_{-2}$
Lateral deviation 2/			1/	0.3 max
x 3/		2.8 1/		2.8 ± 0.3
y 3/		0.0 1/		0.0 ± 0.3
β	- 15° 1/	0°	+ 15° 1/	0° ± 5°
Cap W 3x16q in accordance with IEC Publ. 61 (sheet 7004-106-1)				

ELECTRICAL AND PHOTOMETRIC CHARACTERISTICS

Rated values		V	12			12	
		W	21	5		21	5
Test voltage		V	13.5				
Objective values	Watts	W	25	6		25 at 13.5 V	6
		±%	6	10		6	10
	Luminous flux	lm	440	35			
		±%	15	20			
Reference luminous flux : 440 and 35 lm at approx. 13.5 V							

1/ To be checked by means of a box system, sheets W21/5W/2 and 3.

2/ Maximum lateral deviation of major filament centre from two mutually perpendicular planes both containing the reference axis and one containing axis X-X.

3/ "x"and "y" denote the offset of the axis of the minor filament with respect to the axis of the major filament

CATEGORY W21/5W Sheet W21/5W/2

Screen projection requirements

This test is used to determine, by checking whether:
(a) the major filament is correctly positioned relative to the reference axis and reference plane and has an axis perpendicular, within ± 15°, to the plane through the axis X-X and the reference axis; and whether:
(b) the minor filament is correctly positioned relative to the major filament,
whether a filament lamp complies with the requirements.

Test procedure and requirements.

1 The filament lamp is placed in a holder capable of being rotated about its axis and having either a calibrated scale or fixed stops corresponding to the angular displacement tolerance limits. The holder is then so rotated that an end view of the major filament is seen on the screen on to which the image of the filament is projected. The end view of that filament shall be obtained within the angular displacement tolerance limits. (± 15°).

2. Side elevation
The filament lamp placed with the cap down, the reference axis vertical, and the major filament seen end-on:

2.1. the projection of the major filament shall lie entirely within a rectangle of height "a" and width "b", having its centre at the theoretical position of the centre of the filament;

2.2. the projection of the minor filament shall lie entirely within a rectangle of width "c" and height "d" having its center at a distance "u" above the theoretical position of the centre of the major filament.

3. Front elevation
The filament lamp placed with the cap down and the reference axis vertical, the filament lamp being viewed in a direction at right angles to the axis of the major filament:

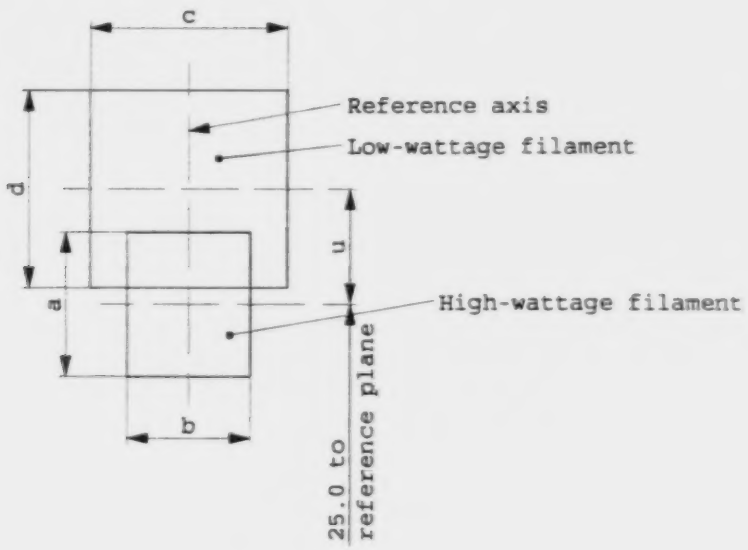
3.1. the projection of the major filament shall lie entirely within a rectangle of height "a" and width "h", centred on the theoretical position of the centre of the filament;

3.2. the centre of the major filament shall not be offset by more than distance "k" from the reference axis;

3.3. the centre of the minor filament shall not be offset from the reference axis by more than ± 2 mm (± 0.4 mm for standard lamps).

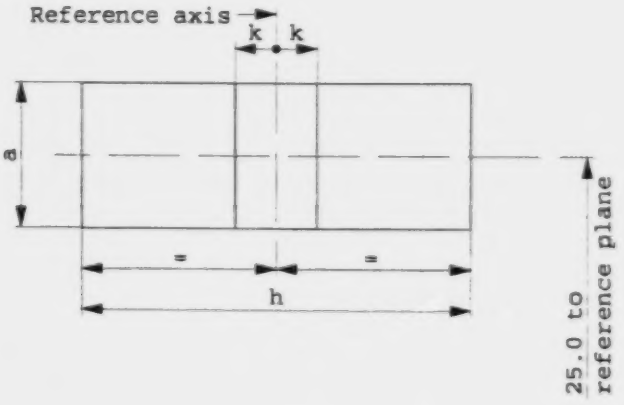
CATEGORY W21/5W Sheet W21/5W/3

Side elevation



Reference	a	b	c	d	u
Dimensions	3.5	3.0	4.8		2.8

Front elevation



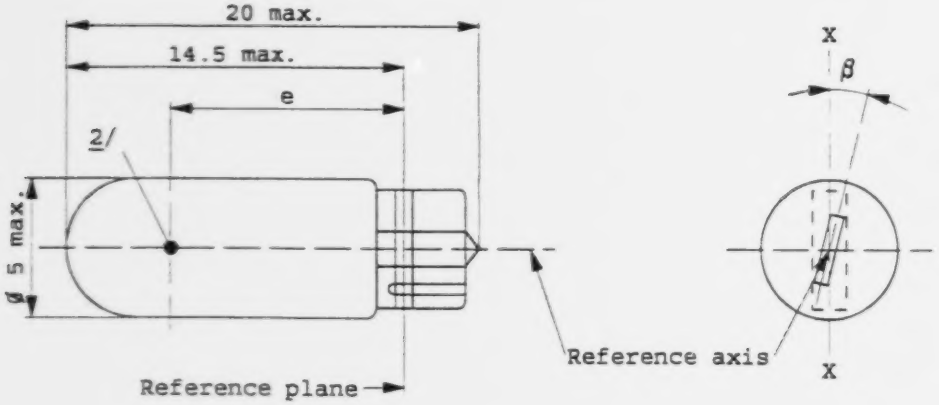
Reference	a	h	k
Dimensions	3.5	9.5	1.0

"

Insert a new sheet W2.3W/1, to read:

"

CATEGORY W2.3W Sheet W2.3W/1



DIMENSIONS in mm		Filament lamps of normal production			Standard filament lamp
		min.	nom.	max.	
e		10.3	10.8	11.3	10.8 ± 0.3
Lateral deviation 1/				1.0	0.5 max.
β		-15°	0°	+15°	0° ± 5°
Cap W 2 x 4.6d in accordance with IEC Publ. 61 (sheet 7004-94-2)					
ELECTRICAL AND PHOTOMETRIC CHARACTERISTICS					
Rated values	Volts		12		12
	Watts		2.3		2.3
Test voltage	Volts		13.5		
Objective values	Watts		2.5 max.		2.5 max.at 13.5 V
	Luminous flux lm		18.6		
	±%		20		
Reference luminous flux : 18.6 lm at approx. 13.5 V					

1/ Maximum lateral deviation of filament centre from two mutually perpendicular planes both containing the reference axis and one containing axis X-X.

2/ See paragraph 3.5.3. "